Response to Office Action Mailed May 9, 2001

A. Claims In The Case

Claims 1-69 have been rejected. Claims 37-38, 69, 115, 135, and 136 have been canceled without prejudice. Claims 1, 6-9, 12, 17, 29, 40-47 and 60 have been amended. Claims 173-175 have been added. Claims 1-36, 39-68 and 173-175 are pending in the application.

B. Election of Claims

On March 29, 2001, Applicant's representative participated in a telephone interview with the Examiner. Applicant sincerely appreciates the Examiner taking the time to discuss the case. In the interview, a provisional election was made with traverse to prosecute the invention of group I, claims 1-69.

Applicant hereby elects claims 1-69, without traverse. Applicant reserves the right to file a divisional application at a later date capturing the subject matter recited in claims 115, 135 and 136.

C. Specification Objection

The disclosure was objected to because of informalities. The specification at page 38, line 22 has been amended for clarification.

D. The Claims Are Not Indefinite Pursuant To 35 U.S.C. § 112, First Paragraph

Claims 37 and 38 were rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Applicant respectfully disagrees with the Examiner's rejections, however, to expedite the case Applicant has canceled claims 37 and 38.

E. The Claims Are Not Indefinite Pursuant To 35 U.S.C. § 112, Second Paragraph

Claims 1-69 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1, 6-9, 12, 12, 17, 29, 40-47 and 60 have been amended for clarification. Applicant submits that all the claims are now definite.

F. The Claims Are Not Anticipated By Lavigne Pursuant To 35 U.S.C. § 102

The Examiner rejected claims 1-2, 7, 9, 10, 14-16, 19, 23, 40-42, 45, 48, 49, 51, 53, 54, 68 and 69 as being anticipated by Lavigne et al, J. Am. Chem. Soc. 1998, 120, 6429-6430 ("Lavigne").

Lavigne reference lists the authors: John J. Lavigne, Steve Savoy, Marvin B. Clevenger, Jason E. Rithchie, Bridget McDoniel, Seung-Jin Yoo, Eric V. Anslyn, John T. McDevitt, Jason B. Shear, and Dean Neikirk. Applicant submits that the authors, John J. Lavigne, Steve Savoy, Marvin B. Clevenger, Jason E. Rithchie, Bridget McDoniel, Seung-Jin Yoo, derived their knowledge of the above-described method from the inventors, Eric V. Anslyn, John T. McDevitt, Jason B. Shear, and Dean Neikirk. Applicant has submitted a declaration under 37 C.F.R. § 1.132, executed by the inventors, attesting to this fact. Applicant submits that the claims are now patentable over the cited art.

G. The Claims Are Not Anticipated By Stabile Pursuant To 35 U.S.C. § 102

The Examiner rejected claims 1-9, 11-16, 18, 19 and 39 as being anticipated by U.S. Patent No. 5,872,623 to Stabile et al ("Stabile"). Applicant respectfully disagrees that the claims are anticipated by Stabile.

The standard for "anticipation" is one of fairly strict identity. To anticipate a claim of a patent, a single prior source must contain all the claimed essential elements. *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 231 U.S.P.Q.81, 91 (Fed.Cir. 1986); *In re Donahue*, 766 F.2d 531, 226 U.S.P.Q. 619, 621 (Fed.Cir. 1985).

Applicant's amended claims 1 and 40 state, in part:

> wherein the light source and detector are positioned such that light passes from the light source, to the particles, and onto the detector during use, and wherein the light source provides an area of light on an upper surface of the sensor array during use, wherein the area of light encompasses two or more cavities.

Support for the amendments to claim 1 can be found, for example, in Applicant's specification which states:

> The support array may be configured to allow a variety of detection modes to be practiced. In one embodiment, a light source is used to generate light which is directed toward the particles. The particles may absorb a portion of the light as the light illuminates the particles. The light then reaches the detector, reduced in intensity by the absorbance of the particles. The detector may be configure to measure the reduction in light intensity (i.e., the absorbance) due to the particles. In another embodiment, the detector may be placed above the supporting member. The detector may be configured to measure the amount of light reflected off of the particles. The absorbance of light by the particles is manifested by a reduction in the amount of light being reflected from the cavity. The light source in either

> embodiment may be a white light source or a fluorescent light source.
> (Specification, page 27, lines 13-23)
>
> Simultaneous detection of several analytes in a mixture was made possible by analysis of the RGB color patterns created by the sensor array.
> (Specification, page 45, lines 1-2)

Stabile does not appear to teach all of the features in claim 1, including, but not limited to, a light source that "provides an area of light on an upper surface of the sensor array during use, wherein the area of light encompasses two or more cavities." Stabile states in part:

> In a first embodiment, the invention provides an apparatus for measuring the amount of light emitted from or transmitted through two or more detection sites of a first set of detection sites on a planar substrate while spatially resolving the measurements for each detection site of the first set, the apparatus comprising: (a) for each detection site of the first set, an addressable source of a light beam directed to that detection site at a first angle; and (b) an array detector comprising a plurality of light responsive pixels, wherein for each detection site of the first set there is at least one light responsive pixel that receives light emitted from or transmitted through that detection site at a second angle that can be the same as the first angle. Preferably, the apparatus further comprises a controller for controlling the addressable beams of light. The controller, preferably, is programmed to operate the light beams **so that the light beams for any two adjacent detection sites on the substrate are not simultaneously illuminated during an experimental measurement**. Preferably, the controller is programmed to operate the beams of light so each detection site of the first set is illuminated in the course of measuring the light emitted from or transmitted through all of the detection sites of the first set.
> (Stabile, col. 1, lines 40-62, emphasis added)

Stabile does not appear to teach or suggest the use of a light source that provides an area of light on an upper surface of the sensor array during use, wherein the area of light encompasses two or more cavities. In fact, Stabile teaches against the use of such a light source. Stabile states in part:

> Preferably, the source light is collimated to increase the accuracy with which the optics minimize cross-talk between detection sites. Preferably, where the source of light comprises multiple light producing devices, each light source has a collimating lens. Each light producing device can have an optical wavelength doubler or an optical wavelength tripler.
> (Stabile, col. 2, lines 33-40)

H. The Claims Are Not Obvious Over Kim Pursuant To 35 U.S.C. § 103(a)

Claims 17 and 52 were rejected as being unpatentable over Lavigne in view of U.S. Patent No. 5,748,091 to Kim ("Kim"). Applicant respectfully disagrees.

As discussed above, Applicant submits that the claims are patentable over the Lavigne reference.

I. The Claims Are Not Obvious Over Ito Pursuant To 35 U.S.C. § 103(a)

Claim 20 was rejected as being unpatentable over Stabile in view of U.S. Patent No. 5,583,054 to Ito et al. ("Ito"). Applicant respectfully disagrees.

For at least the same reasons stated above with respect to Stabile, Applicant submits that claim 20 is patentable over the cited combination.

J. The Claims Are Not Obvious Over Colin Pursuant To 35 U.S.C. § 103(a)

Claim 21 was rejected as being unpatentable over Stabile in view of U.S. Patent No. 5,773,307 to Colin et al. ("Colin"). Applicant respectfully disagrees.

For at least the same reasons stated above with respect to Stabile, Applicant submits that

claim 21 is patentable over the cited combination.

K. The Claims Are Not Obvious Over Clark Jr. Pursuant To 35 U.S.C. § 103(a)

Claim 22 was rejected as being unpatentable over Stabile in view of U.S. Patent No. 5,690,807 to Clark Jr. et al. ("Clark Jr."). Applicant respectfully disagrees.

For at least the same reasons stated above with respect to Stabile, Applicant submits that claim 22 is patentable over the cited combination.

L. The Claims Are Not Obvious Over McGarry Pursuant To 35 U.S.C. § 103(a)

Claims 24 and 55 were rejected as being unpatentable over Lavigne in view of U.S. Patent No. 5,248,742 to McGarry et al. ("McGarry"). Applicant respectfully disagrees.

As discussed above, Applicant submits that the claims are patentable over the Lavigne reference.

M. The Claims Are Not Obvious Over Bretscher Pursuant To 35 U.S.C. § 103(a)

Claims 25 and 56 were rejected as being unpatentable over Lavigne in view of U.S. Patent No. 5,714,122 to Bretscher et al. ("Bretscher"). Applicant respectfully disagrees.

As discussed above, Applicant submits that the claims are patentable over the Lavigne reference.

N. The Claims Are Not Obvious Over Russell Pursuant To 35 U.S.C. § 103(a)

Claims 27 and 58 were rejected as being unpatentable over Lavigne in view of U.S. Patent No. 5,137,833 to Russell ("Russell"). Applicant respectfully disagrees.

As discussed above, Applicant submits that the claims are patentable over the Lavigne reference.

O. The Claims Are Not Obvious Over Schutz Pursuant To 35 U.S.C. § 103(a)

Claims 28 and 59 were rejected as being unpatentable over Lavigne in view of Biophysical Journal, Vol. 74, May 1998, authored by Schutz et al. ("Schutz"). Applicant respectfully disagrees.

As discussed above, Applicant submits that the claims are patentable over the Lavigne reference.

P. The Claims Are Not Obvious Over Arnold Pursuant To 35 U.S.C. § 103(a)

Claims 26 and 57 were rejected as being unpatentable over Lavigne in view of U.S. Patent No. 5,616,790 to Arnold et al. ("Arnold"). Applicant respectfully disagrees.

As discussed above, Applicant submits that the claims are patentable over the Lavigne reference.

Q. The Claims Are Not Obvious Over Issachar Pursuant To 35 U.S.C. § 103(a)

Claims 29 and 60 were rejected as being unpatentable over Lavigne in view of U.S.

Patent No. 5,156,972 to Issachar ("Issachar"). Applicant respectfully disagrees.

As discussed above, Applicant submits that the claims are patentable over the Lavigne reference.

R. The Claims Are Not Obvious Over Fish Pursuant To 35 U.S.C. § 103(a)

Claims 30, 35, 36, 61, 66 and 67 were rejected as being unpatentable over Lavigne in view of U.S. Patent No. 5,126,276 to Fish et al. ("Fish"). Applicant respectfully disagrees.

As discussed above, Applicant submits that the claims are patentable over the Lavigne reference.

S. The Claims Are Not Obvious Over Lauritzen Pursuant To 35 U.S.C. § 103(a)

Claims 31 and 62 were rejected as being unpatentable over Lavigne in view of Electrophoresis 1993, 14, 852-859, authored by Lauritzen et al. ("Lauritzen"). Applicant respectfully disagrees.

As discussed above, Applicant submits that the claims are patentable over the Lavigne reference.

T. The Claims Are Not Obvious Over Khanna Pursuant To 35 U.S.C. § 103(a)

Claims 32 and 63 were rejected as being unpatentable over Lavigne in view of U.S. Patent No. 5,223,393 to Khanna et al. ("Khanna"). Applicant respectfully disagrees.

As discussed above, Applicant submits that the claims are patentable over the Lavigne reference.

U. The Claims Are Not Obvious Over O'Daly Pursuant To 35 U.S.C. § 103(a)

Claims 33 and 64 were rejected as being unpatentable over Lavigne in view of U.S. Patent No. 5,391,272 to O'Daly et al. ("O'Daly"). Applicant respectfully disagrees.

As discussed above, Applicant submits that the claims are patentable over the Lavigne reference.

V. The Claims Are Not Obvious Over Cho Pursuant To 35 U.S.C. § 103(a)

Claims 34 and 65 were rejected as being unpatentable over Lavigne in view of Science Vol. 261, September 3, 1993, authored by Cho et al. ("Cho"). Applicant respectfully disagrees.

As discussed above, Applicant submits that the claims are patentable over the Lavigne reference.

W. The Claims Are Not Obvious Over Stabile Pursuant To 35 U.S.C. § 103(a)

Claims 43, 44, 46, 47 and 50 were rejected as being unpatentable over Lavigne in view of U.S. Patent No. 5,872,623 to Stabile et al. ("Stabile"). Applicant respectfully disagrees.

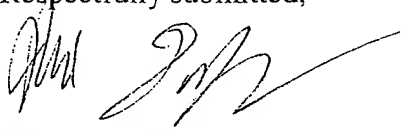
As discussed above, Applicant submits that the claims are patentable over the Lavigne reference.

X. Summary

Based on the above, Applicant submits that all claims are now in condition for allowance. Favorable reconsideration is respectfully requested.

Applicant respectfully requests a two-month extension of time to respond to the Office Action dated May 9, 2001. A fee authorization in the amount of $400.00 is enclosed for the extension of time fee. If any further extension of time is required, Applicant hereby requests the appropriate extension of time. If any fees are inadvertently omitted or if any additional fees are required or have been overpaid, please appropriately charge or credit those fees to Conley, Rose & Tayon, P.C. Deposit Account Number 05-1505/5119-00501/EBM

Respectfully submitted,



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Strikethrough Version of Amended Specification

In one embodiment, a fluorescent group may be incorporated into a diamine monomer for use in the synthetic sequences. Examples of monomeric units which may be used for the synthesis of a receptor are depicted in FIG. 14. The depicted monomers include fluorescent indicator groups. After synthesis, the interaction of the receptor with the analyte may induce changes in the spectroscopic properties of the molecule. Typically, hydrogen bonding or ionic substituents on the fluorescent monomer involved in analyte binding have the capacity to change the electron density and/or rigidity of the fluorescent ring system, thereby causing observable changes in the spectroscopic properties of the indicator. For fluorescent indicators such changes may be exhibited as changes in the fluorescence quantum yield, maximum excitation wavelength, and/or maximum emission wavelength. This approach does not require the dissociation of a preloaded fluorescent ligand, which may be limited in response time by $k_{(off)}$~~)~~. While fluorescent ligands are shown here, it is to be understood that a variety of other ~~ligand~~ ligands may be used including colorimetric ligands.

Strikethrough Version of Claims

1.(amended) A system for detecting an analyte in a fluid comprising:

a light source;

a sensor array, the sensor array comprising a supporting member comprising ~~at least one cavity~~ a plurality of cavities formed within the supporting member;

a ~~particle~~ plurality of particles, the ~~particle~~ particles being positioned within the ~~cavity~~ cavities, wherein the ~~particle is configured to~~ particles produce a signal when the ~~particle~~

~~interacts~~ particles interact with the analyte during use; ~~and~~

a detector, ~~the detector being configured to detect~~ wherein the detector detects the signal produced by the interaction of the analyte with the particle during use;

wherein the light source and detector are positioned such that light passes from the light source, to the particle, and onto the detector during use, and wherein the light source provides an area of light on an upper surface of the sensor array during use, wherein the area of light encompasses two or more cavities.

6.(amended) The system of claim 1, wherein the sensor array further comprises a bottom layer and a top cover layer, wherein the bottom layer is positioned below a bottom surface of the supporting member, and wherein the top cover layer is positioned above the upper surface of the supporting member, and wherein the bottom layer and the top cover layer are positioned such that the particle is ~~substantially~~ contained within the cavity by the bottom layer and the top cover layer.

7.(amended) The system of claim 6, wherein the bottom layer and the top cover layer are ~~substantially~~ transparent to at least a spectral portion of the light produced by the light source.

8.(amended) The system of claim 1, wherein the sensor array further comprises a bottom layer and a top cover layer, wherein the bottom layer is coupled to a bottom surface of the supporting member, and wherein the top cover layer is coupled to a top surface of the supporting member; and wherein both the bottom layer and the top cover layer are coupled to the supporting member such that the particle is ~~substantially~~ contained within the cavity by bottom layer and the top cover layer.

9. (amended) The system of claim 8, wherein the bottom layer and the top cover layer are ~~substantially~~ transparent to at least a spectral portion of the light produced by the light source.

12. (amended) The system of claim 1, wherein the supporting member is formed from a plastic material, and wherein the sensor array further comprises a top cover layer, the top cover layer being coupled to the supporting member such that the particle is ~~substantially~~ contained within the cavity, and wherein the top cover layer ~~is configured to allow~~ allows the fluid to pass through the top cover layer to the particle, and wherein both the supporting member and the top cover layer are ~~substantially~~ transparent to light produced by the light source.

17. (amended) The system of claim 1, wherein the detector comprises a ~~semiconductor based~~ photodetector, and wherein the detector is coupled to the sensor array.

29. (amended) The system of claim 23, wherein the particles further comprises an indicator, wherein the indicator is ~~associated~~ with coupled to the receptor such that in the presence of the analyte the indicator is displaced from the receptor to produce the signal.

40. (Amended) A system for detecting an analyte in a fluid comprising:

a light source;

a sensor array, the sensor array comprising a supporting member comprising a plurality of cavities formed within the supporting member, wherein the supporting member comprises silicon;

a plurality of particles, the particles comprising a receptor molecule covalently linked to a polymeric resin, wherein the particles are positioned within the cavities, and wherein each of the particles ~~is configured to produce~~ produces a signal when the particle interacts with the analyte during use; and

a detector ~~configured to detect~~ wherein the detector detects the signal produced by the interaction of the analyte with the particle during use;

wherein the light source and detector are positioned such that light passes from the light source, to the particle, and onto the detector during use, and wherein the light source provides an area of light on an upper surface of the sensor array during use, wherein the area of light encompasses two or more cavities.

41. (Amended) The system of claim 40, wherein the system is configured to ~~substantially~~ simultaneously detect a plurality of analytes in the fluid.

42. (Amended) The system of claim 40, wherein each cavity ~~is configured to hold~~ holds a single particle.

43. (Amended) The system of claim 40, wherein each cavity ~~is configured to hold~~ holds a plurality of particles.

44. (Amended) The system of claim 40, wherein the sensor array further comprises a bottom layer and a top cover layer, wherein the bottom layer is positioned below a bottom surface of the supporting member, and wherein the top cover layer is positioned above the upper surface of the supporting member, and wherein the bottom layer and the top cover layer

are positioned such that the particle is ~~substantially~~ contained within the cavity by the bottom layer and the top cover layer.

45. (Amended) The system of claim 44, wherein the bottom layer and the top cover layer are ~~substantially~~ transparent to light produced by the light source.

46. (Amended) The system of claim 40, wherein the sensor array further comprises a bottom layer and a top cover layer, wherein the bottom layer is coupled to a bottom surface of the supporting member, and wherein the top cover layer is coupled to a top surface of the supporting member; and wherein both the bottom layer and the top cover layer are coupled to the supporting member such that the particle is ~~substantially~~ contained within the cavity by bottom layer and the top cover layer.

47. (Amended) The system of claim 46, wherein the bottom layer and the top cover layer are ~~substantially~~ transparent to light produced by the light source.

60. (Amended) The system of claim 40, wherein the particles further comprises an indicator, wherein the indicator is ~~associated~~ coupled with the receptor such that in the presence of the analyte the indicator is displaced from the receptor to produce the signal.